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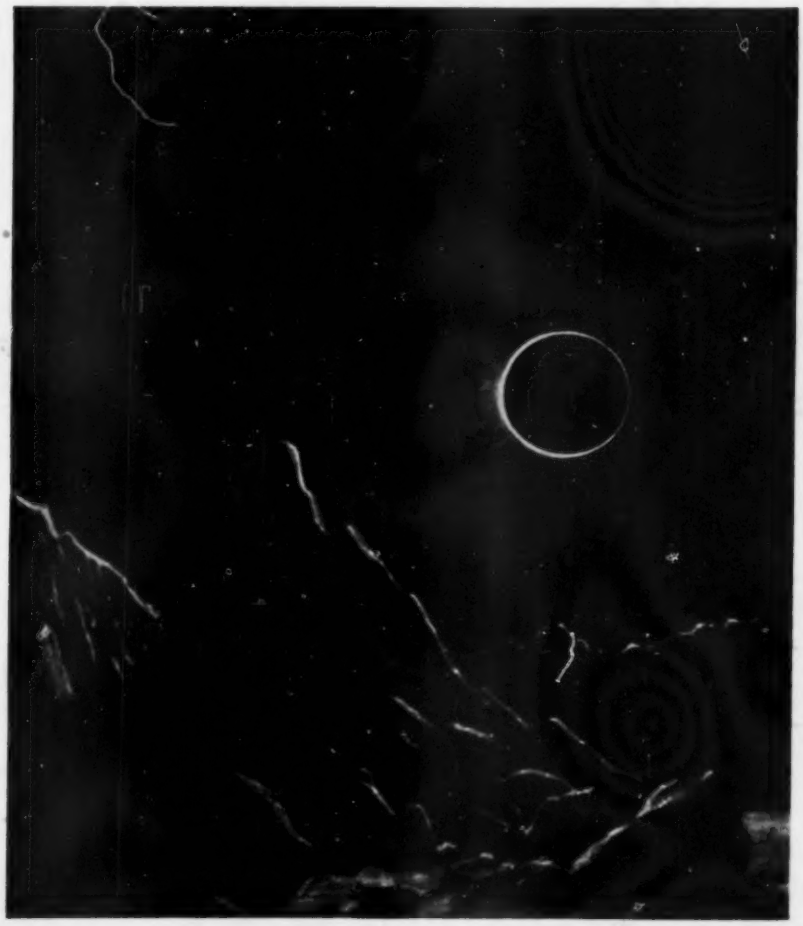
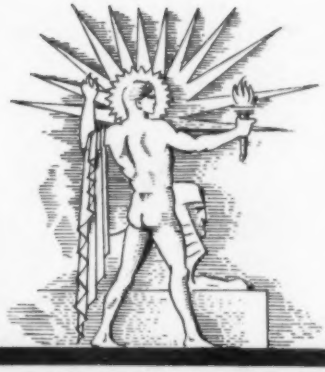
THE WEEKLY SUMMARY OF CURRENT SCIENCE •





October 29, 1938

To the Man in the Moon

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A SCIENCE SERVICE PUBLICATION

Do You Know?

Colonial housewives used to freeze pies in winter and store them.

A cloth for sports clothes is being made out of banana and cocoanut fibers.

Seeds of the hawthorn fruit yield a thin, drying oil, possibly useful in paint.

A medieval idea in keeping off moths was to put rosemary in chests and clothes cupboards.

At the old Tilly Foster mine in New York State, a mineralogist recently found 55 different kinds of minerals.

Using a new method, it is claimed that a house of prefabricated concrete slabs can be built in four hours.

In India, 21 per cent. of the cloth is woven by hand looms; in China nearly 75 per cent. is thus produced.

Tree kangaroos spend most of their time in trees and are said to be able to leap to the ground from thirty-foot height without injury.

A botanist has been rescuing valuable facts about Missouri plants by making a survey on land which will be flooded by the Wappapello Dam.

A milk tooth of a Neandertal child, who lived perhaps 60,000 years ago, was found years ago at Gibraltar and recently was acquired by the British Museum in London.

Ancient Egyptians called leprosy "death before death."

Experimenters report that fish have a sense of smell, and can distinguish bright colors.

A "pinhole detector" for finding flaws in steel strip while it moves swiftly past has been developed.

About 500 unclaimed wild horses were rounded up by airplane in Oregon last year and removed from grazing districts.

Iris and pansy flowers were sources of coloring material in the seventeenth century.

Soviet mountain climbers have placed a bust of Stalin on the summit of Mount Elbrus.

Australia has put its picturesque animal, the duck-billed platypus, on a ninepenny stamp.

The great fire that swept Chicago in 1871 demolished 17,500 buildings and caused $168,000,000 property loss.

QUESTIONS DISCUSSED IN THIS ISSUE

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SCIENCE NEWS LETTER

Vol. 34 OCTOBER 29, 1938 *No. 18*

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 2101 Constitution Avenue, Washington, D. C., *Edited by* WATSON DAVIS.

Subscriptions—$5.00 a year; two years $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Members of the American Association for the Advancement of Science have privilege of subscribing to SCIENCE NEWS LETTER at the reduced price of $3 per year. Applications for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington, D. C.

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Cable address: Scienserve, Washington.

Entered as second class matter at the postoffice at Washington, D. C., under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature and in the Engineering Index.

Advertising rates on application. Member Audit Bureau of Circulation.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation, with trustees nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and the journalistic profession.

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SURGERY

New Operation Promises Conquest of Angina Pectoris

College of Surgeons Hears That Knife Can Cure Stomach Ulcers; Smoking Causes Increased Cancer

ANGINA PECTORIS, excruciatingly painful type of heart ailment which strikes down men and women in the very prime of life, may some day be conquered by the surgeon's knife.

An operation which gives hope of saving many lives threatened by this disease was demonstrated before the American College of Surgeons meeting in New York City.

The operation consists of giving the heart itself a new supply of blood. The trouble in angina pectoris is that the arteries which carry blood to the heart muscle, to enable it to pump blood to the rest of the body, become blocked.

An operation to remedy this condition has already been successfully used on human patients by Dr. Claude Beck of Cleveland. A simpler way of doing the job was demonstrated by Dr. Samuel A. Thompson of New York, at the Flower Fifth Avenue Hospital.

Dr. Thompson has not yet used the new operation on human patients, but dogs on which he performed it were well and active even if all the arteries which normally nourish the heart were blocked or tied off. Without the operation, half of the animals in this condition invariably died.

The new blood supply comes from the sac which surrounds the heart. In the operation, this tissue is made to adhere to the heart muscle, so that its blood vessels grow into the heart, carrying their blood with them. Dr. Beck has given the heart a new blood supply by the more difficult operation of attaching a piece of chest muscle.

The operation sounds like a cure for angina pectoris, but surgeons at the meeting cautioned that it is still in the trial stage.

Stomach Ulcers Cured

PATIENTS suffering from stomach or digestive tract ulcer can be permanently cured and recurrence of ulcers prevented if the surgeon cuts out two-thirds to three-fourths of the stomach, Prof. Hans Finsterer of Vienna told members of the American College of Surgeons.

He reported 88 out of 96 patients permanently cured by this extensive operation. He finds it much safer to do the operation under local anesthetic instead of under ether or other general anesthetic.

They Get Along

Most patients get along quite well with the remaining small stomach. In a few cases anemia develops but this can be controlled by feeding liver or giving liver extracts. The complaints because of the small stomach are minor, Prof. Finsterer pointed out, compared to the dangers of a gastrojejunal ulcer.

When ulcers come back in a patient after operation, it is not because of "an unusual disposition to develop ulcers which cannot be controlled surgically," Prof. Finsterer declared. He claims recurrence of ulcers is due to failure of the surgeon to remove enough of the stomach in the first place. He described patients who had had from three to six operations without permanent cure until two-thirds of the stomach was removed.

Object of removing this large section of the stomach is to insure the lower part of the digestive tract being completely free of acid, Prof. Finsterer explained.

A short-circuiting operation, in which a new opening is made from the stomach to the lower portion of the digestive tract, is not advised by Prof. Finsterer. He says it should be done "only in rare, exceptional instances." His point is that while this short-circuiting operation reroutes food and stomach juices past the upper 10 inches of the intestines, thus protecting them from irritation, new ulcers are likely to form in the next section of intestine.

After cutting out two-thirds of the stomach, some fancy surgical needlework is required, it appeared from Prof. Finsterer's report, to attach the remaining third of the stomach to the rest of the digestive tract.

FOR GRECIAN BEAUTY

This delicate bronze mirror helped some Greek beauty of the sixth century B. C. to get her make-up on straight. Now acquired by the Metropolitan Museum of Art in New York, it is pronounced almost perfectly preserved. The crusty green of the disk was originally golden bronze. and being slightly convex it diminished the image, so that the user might see not only her face but headdress and neck as well.

Smoking Causes Cancer

MORE persons are dying of cancer of the lung than ever before, probably because more persons are smoking and inhaling tobacco smoke than ever before. This startling statement was made by Drs. Alton Ochsner and Michael De Bakey of Tulane University School of Medicine, New Orleans, at a cancer symposium at the meeting.

"The inhaled smoke, constantly repeated over a long period of time, undoubtedly is a source of irritation" to the lining of the bronchial tubes, the New Orleans surgeons gave as their opinion.

Ten to fifteen out of every 100 primary cancers, not those that have spread from other cancers elsewhere, are lung cancers, they stated. Lung cancer is found in one or two out of every 100 persons examined after death.

Persistent cough with expectoration, bloody sputum and discomfort in the chest, are the most prominent symptoms, and in any one past 40 years of age should be considered signs of cancer until proved otherwise.

The only hope of cure is to remove the entire lung and the lymph nodes in the chest. This has been done in 87 patients, eight of them operated on by the New Orleans surgeons. Of their eight patients, three survived. One is still living two and one-half years after the operation. The others were only recently operated. Of the 79 other patients, 50 died and 29 recovered.

Neon Signs For Cancer

TO CUT down cancer deaths, neon signs should be installed in every restaurant stating:

"Indigestion does not start after 40 in a man who has been able to eat everything till then."

This suggestion for fighting stomach cancer was made by Dr. W. H. Ogilvie, of London, England.

Stomach cancer, he said, is the commonest and least operable of all cancers. Its treatment by surgery has the highest death rate and the lowest cure rate.

Usually the disease has progressed too far for operation by the time the patient consults a surgeon. This is partly due to the fact that many patients have no warning beyond an indefinable loss of strength until nearly the whole stomach is cancerous. Many who come to the surgeon too late, however, have suffered from digestive discomfort for months or even a year or two, dieting and taking alkalis, before going to their physician for an overhaul. It is to warn these patients that Dr. Ogilvie suggested the neon light signs in every restaurant.

A similar but "more discreet" notice, he suggested, might be put in the office of physicians who are not surgeons. This sign would read: "Gastric ulcer does not present itself for the first time after 40." The idea is that physicians should not treat a middle aged patient for stomach ulcers until cancer has been absolutely ruled out.

There are exceptions to both warning statements, Dr. Ogilvie said, but a large number of patients can be brought "from the hopeless to the hopeful category" if these twin warning signs are heeded.

Only from five to 10 out of every 100 stomach cancer patients survive five years after operation, Dr. Ogilvie said. He believes more patients can be saved by performing a more extensive operation than is customary now.

"Sinister features" of stomach cancer are its wide and early spread through the lymphatic channels and its tendency to shed cancer cells that graft themselves onto other tissues in the abdomen. To prevent such spread as much as possible, Dr. Ogilvie advised his surgical colleagues to remove the whole lymphatic tract along with the cancer and the cancerous stomach, just as in cases of breast cancer, the cancer, the entire breast and all the lymphatic channels and glands are removed.

Best Birth Certificate

A PALM print taken of baby's chubby little hand when he is born is the best birth certificate he can have, Dr. Gilbert P. Pond, of the West Suburban Hospital, Oak Park, Ill., told members of the American College of Surgeons meeting at the Hospital Standardization Conference.

If new-born babies get mixed-up in the hospital, as they sometimes do, in spite of bracelets or other identifying tags, palm prints taken at birth would provide conclusive evidence of the baby's identity. It is a method of identification that will stand the test of the highest courts, Dr. Pond said.

Foot printing, once popular for this purpose, is definitely out, Dr. Pond indicated, because it is not reliable and not lasting.

Besides preventing baby mix-ups, when the wrong parents take home the wrong baby, palm prints have other important uses. If universally adopted, it would, Dr. Pond said, provide: an incontrovertible proof of birth and identity for the life of the infant; a means of identifying abandoned children and foundlings (and would consequently deter child abandonment); a means of identifying returned, kidnapped children regardless of time and even after death; a means of identifying unknown children after such major disasters as earthquakes or extensive conflagrations; a means of identifying cases of amnesia, unconsciousness and unknown dead after a generation of prints were on file; a record of relationship between the infant and its mother if her fingerprints are placed on the same card as the infant's palm prints.

Science News Letter, October 29, 1938

PLANT PATHOLOGY

Gas Attack Treatment Saves Tobacco Crop

Double Fumigation With Benzol Kills Blue Mold Fungus; Way Open For Application of Method to Other Diseases

AMERICA'S great tobacco crop has been saved from its most menacing enemy by a gas warfare method, and the way opened for application of the same method in attacks on other plant diseases, by scientists of Duke University and the Virginia Agricultural Experiment Station in cooperative investigations.

"Mugged" as Blue Mold by the tobacco growers, and "finger-printed" as *Peronospora tabacina* by the experts, this Tobacco Enemy No. 1, which is a plant itself, was singled out of several thousand plant diseases for special investigation by the scientists.

The mold is a true gangster in the tobacco seed beds. It works only in darkness, preferably between midnight and daylight. Like certain human diseases, it thrives best only upon a healthy living host.

Its dust-like reproduction bodies, or spores, are scattered far and wide by the winds, or fall to the ground in leaves and there lie in wait for any tobacco plants which unsuspecting farmers may plant in the infested soil. The wind-borne spores, which scattered from Florida to Canada last year, send out feeding tubes into any part of the tobacco leaf, even the hairs, but only when dew or water is on the leaf. Although it sometimes appears in the fields, in early spring, its greatest destruction is to be found in tobacco seed beds, and all growers have learned to fear it.

When sprays were applied, their disinfecting action did not always reach the microscopic spores. Almost simultaneously, investigators in Australia and at Duke University realized that new technics in plant protection were neces-

sary if this vicious culprit was to be stopped.

Gas was the logical answer, gas that would penetrate to all parts of the plant above ground and cover all exposed surfaces. Several chemicals were tried. Some destroyed the seed beds like fire, some were ineffective. Benzol, xylol and tolulol, hydrocarbons distilled from coal, were effective.

An Accident

But an accident occurred; a seed bed upon which investigations were being conducted was destroyed. "Too much benzol gas," said one; "temperature of fumigation too high," said another. So the work was taken to the laboratory. Plants were grown in glass jars, temperatures were regulated, benzol vapor concentrations were precisely controlled and checked by gas analysis technic.

The effect of benzol on tobacco seedlings was minutely studied by scientists of Duke University and of the Virginia Agricultural Experiment Station. Working night and day, the investigators determined precisely how much benzol was required to injure seedlings.

The work was checked in the field on farm seed beds. Night after night seed beds were fumigated. Night after night gas analyses of seed bed air samples were made. Over 1000 square yards of tobacco beds in North Carolina and Virginia were fumigated. The tricks of the parasite were learned in the cold, wet nights of early spring.

Time after time, the Blue Mold was destroyed on the second night of fumigation. Time after time, the investigators started and stopped it at will.

Tin pans of all sorts littered the seed beds. Benzol was placed in them and a heavy cover of cotton sheeting was drawn over the beds to be fumigated. A little water on the cover sealed it and the gas rising from the pans was allowed to do its deadly work on the fungus during the night hours. Mechanical evaporators made of pipe, lamp wicks and tin cans were invented by farmers and engineers alike.

First Time

For the first time in man's long fight against plant disease, a method was demonstrated which would kill the parasite without harming the plants. The disease could be held in check with one-thirtieth the amount of vapor required to destroy the plants. One-sixth of the amount of gas lethal to the plants would completely destroy the fungus after the second application.

EFFECT OF BENZOL

The seed bed at left was fumigated with benzol vapor. That on the right was not. Blue mold can be seen destroying the unfumigated plants. Separating the two beds is a board to which is attached a roll of heavy cotton sheeting.

METALLURGY

Silver Tarnish Is Prevented By Invisible Oxide Film

Colorless Layer of Beryllium or Aluminum Oxide Gives Astonishing Protection and Perhaps Longer Wear

THE dark cloud of tarnish that spreads over silver in our dwellings is about to be dissipated by a new scientific method.

A new way of preventing silver tarnishing, with promise of practical industrial application, has been developed through fundamental metallurgical research in the Cambridge University laboratories of Prof. R. S. Hutton and Dr. U. R. Evans. It consists of developing an invisible coating of beryllium or aluminum oxide over the silver—a colorless layer of the stuff of beryls or sapphires.

Drs. G. J. Thomas and L. E. Price constituted the research team. Modern science cooperated with an ancient British institution, the Worshipful Company of Goldsmiths, founded in 1320 and still the authority for the Hallmarking of sterling silver and for controlling the British coinage. This organization initiated and financed the researches.

Two successful ways of spreading the protective coating over the silver have been devised. First the oxide film was produced by a process of heat treating specially alloyed silver under special conditions. The alternate method which can be applied to old as well as new silver objects consists in electro-depositing the films upon the silver.

The hint that led to the development of the new silver protection came from recent scientific research which has indicated that most incorrodible or passive metals owe their properties to the existence of invisible protective oxide films found upon their surface. Metallurgists knew that stainless steel did not corrode and rust because of an oxide film formed of the chromium and nickel added to the iron. The Cambridge metallurgists therefore hunted for such an oxide that could be formed from some metal added to the silver. German research suggested that the protective ef-

fect of oxides was generally associated with high electrical resistivity of the oxides and this led to extensive studies of alloys of silver containing aluminum, beryllium or silicon.

Then the problem was how to get an oxide film of these metals formed before the silver itself would oxidize. The fact that sterling silver requires 92.5 per cent. silver prevented the adding of large amounts of these metals analogous to practice in stainless steel making. The greater affinity of aluminum and beryllium for oxygen came to the rescue. The trick was to give the metal just enough oxygen to satisfy the added light metals but not the silver. This was done by heat treating at about 400 degrees Centigrade in an atmosphere of pure hydrogen dried with concentrated sulfuric acid, leaving just a little water vapor, enough to allow selective oxidation of the lighter metals.

Before the film-protective methods were devised, extensive tests were made on over 100 alloys including many that had previously been thought to show promise but none of these showed any hopeful prospects. In smoky English kitchens, in rural, village and city sitting rooms, in other places where the atmosphere might be hard on silver, triplicate samples were placed for varying periods of time. The tarnish was measured by various methods, ranging from visual inspection to a precise electrochemical analysis, which dissects various constituents in the millionth of an inch tarnish film. This film was found to consist of not just silver sulfide, but also of silver sulfate, cuprous oxide, and cuprous sulfide, and the methods employed enabled these tarnish products to be quantitatively estimated.

May Resist Wear

The protective effect of these processes is astonishing so far as the prevention of tarnishing is concerned, but it is too early to speak with assurance on wear resistance, although the well known hardness and abrasion resistance of the oxides of aluminum and beryllium offer hopeful prospects.

Other metals may be protected by the selective oxidation method. The same principle has been applied to prevent the high temperature scaling of copper, an achievement that gives promise of industrial utilization.

The control of the methods by the Worshipful Company of Goldsmiths of London, a quasi-public survival of the old guild of workers in precious metals, will allow the industrial development of the new process in such a way that there will be no monopoly by any one manufacturer. The experimenters feel that their novel scientific approach to the tarnishing problem has given very promising results, but that much remains to be done to test the wear resistance and other properties of the protective films and to develop the treatment processes to simplify them for industrial application.

Science News Letter, October 29, 1938

PALEONTOLOGY

Human-Like Tracks in Stone Are Riddle to Scientists

They Can't Be Human Because They Are Much Too Old—But What Strange Biped Amphibian Can Have Made Them?

WHAT was it that lived 250 million years ago, and walked on its hind legs, and had feet like a man?

No, this isn't an ordinary riddle, with a pat answer waiting when you give it up.

It is a riddle of science, to which science has not yet found any answer. Not that science gives it up. Maybe the answer will be found some day, in a heap of broken and flattened fossil bones under a slab of sandstone.

But as yet all there is to see is a series of 12 foot-prints shaped strangely like those of human feet, each 9½ inches long and 6 inches wide across the widest part of the rather "sprangled-out" toes. The prints were found in a sandstone formation known to belong to the Coal Age, about 12 miles southeast of Berea, Ky., by Dr. Wilbur G. Burroughs, professor of geology at Berea College, and William Finnell.

Recently Prof. Burroughs was visited, in his laboratory by some Kentucky mountain men, who took him up into their hills and showed him another place where there were many of the footprints. This mountain site, indeed, seems to have been the "Old Kentucky Home" of a whole family of the mysterious animals, for Prof. Burroughs reports that the footprints "range in size from small ones about 4½ inches long to tracks the size I have written you about," which were nearly 10 inches in length.

Newest find of the mysterious footprints was made on a rock outcrop in a pasture near Festus, Mo., about 30 miles down river from St. Louis. Thomas L. Donnell, who found them, poured plaster of Paris into the prints to make casts. He sent the casts to Alfred Baily, director of the Colorado Museum of Natural History, who in turn forwarded them to Charles W. Gilmore, curator of paleontology of the U. S. National Museum in Washington, D. C.

Mr. Gilmore states that some tracks like these, in sandstone of the same geological age, were found several years ago, in Pennsylvania. But neither in Pennsylvania, Missouri, nor Kentucky has there ever been found even one fossil bone of a creature that might have made the tracks.

Mr. Gilmore, searching old scientific publications, discovered that similar tracks had been found on the Missouri bank of the Mississippi river long before. In the American Journal of Science for 1822 there were letters to the editor by Henry R. Schoolcraft, noted early American scientist, and Senator Thomas H. Benton, telling of "human" footprints in the rocks along the waterfront at St. Louis. Mr. Schoolcraft added that these prints even then had long been known to the original French settlers of the city.

Human Size

The footprints are exceedingly curious things. They are the right size to be human—nine or ten inches in length—and they are almost the right shape. Practically everyone who sees them thinks at first they were made by human feet and it is almost impossible to persuade some people that they were not.

If the big toes were only a little bigger, and if the little toes didn't stick out nearly at a right angle to the axis of the foot, the tracks could easily pass for those of a man. But the boldest estimate of human presence on earth is only a million years—and these tracks are 250 times that old!

The highest known forms of life in the Coal Age were amphibians, animals related to frogs and salamanders.

THESE AREN'T HUMAN

But they look enough that way to fool almost everybody. They are footprints in sandstone, made ages ago by a still unknown animal in the late Coal Age. These prints are among those studied by Prof. W. C. Burroughs of Berea College, Ky.

If this was an amphibian it must have been a giant of its kind.

A further puzzling fact is the absence of any tracks of front feet. The tracks, apparently all of the hind feet of biped animals, are turned in all kinds of random directions. At Berea, two of them are side by side, as though one of the creatures had stood still for a moment. A half-track vanishes under a projecting layer of iron oxide, into the sandstone.

So the riddle stands. A quarter of a billion years ago, this Whats-it That Walked Like a Man left footprints on widely scattered sands that time hardened into rock. Then he vanished. And now scientists are scratching their heads.

Science News Letter, October 29, 1938

MEDICINE

Human Cancer Transplanted Onto Rabbit Eyes for Study

Experiment May Determine Whether Protein Continues To Be Human or Takes on Rabbit Characteristics

CANCER from a woman's breast grafted successfully onto eyes of rabbits has opened new research vistas in the anti-cancer fight that make Rockefeller Institute for Medical Research scientists say frankly they have a new technique of "unlimited possibilities."

This may be the step toward solving the problems of cancer's cause, growth and immunity.

Dr. Harry S. N. Greene of the Rockefeller Institute laboratories announced to the scientific world (*Science*, Oct. 24) his success in transplantation of human cancer to animals.

"We hope to learn something about the specific nature of the protein involved in cancer," Dr. Greene said enthusiastically when interviewed by Science Service. "We want to know whether after the transfer the protein continues to be human or whether it takes on rabbit characteristics."

"If we can immunize a rabbit against human normal tissue and the transplanted cancer continues to grow, we will have taken a long step toward the understanding of cancer."

Dr. Greene made it clear that the present research is aimed at the cause and not directly at the cure of this dread disease.

Several other investigators in the past have claimed to have performed transplants from humans to animals but their work has not been widely accepted. In Dr. Greene's experiments, the human grafts took in 7 out of 12 rabbits. The human cancers have grown in the rabbits slowly but progressively for more than 80 days. Some of the cancers have multiplied themselves until they are five times original size.

Rabbit tumors have been transplanted onto the eyes of guinea pigs and serial transplants have been made by Dr. Greene through three generations.

Dr. Greene suggests that "it seems highly probable that human tissues can be maintained indefinitely in the foreign host."

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PHYSICS

New Cosmic Ray Studies Show Huge Bursts of Energy

TREMENDOUS bursts of atomic energy, caused when cosmic rays come down to earth, may scatter atomic debris over a room some 65 feet on a side, it is concluded in new cosmic ray studies (*Nature*, Oct. 15).

Physicists of the University of Manchester, Drs. L. Jánossy and A. C. B. Lovell, report studies in which they made cosmic ray bursts, or showers as they are called, take their own pictures in a cloud chamber. Only when cosmic ray particles set off "trigger" mechanisms placed over 15 feet apart were photographs of the tracks taken.

Some of the bursts of atomic catastrophe contained 30,000 separate tracks, they estimate. They conclude that the total energy of a single burst could be as high as 10,000,000,000,000,000 electron volts.

This energy, of 10,000 trillion electron volts, far surpasses any efforts of man to create high energy with machines.

The peak energy now obtained from atom smashing machines like cyclotrons is less than 15,000,000 electron volts. Even the great cyclotron now being built for Prof. E. O. Lawrence at the University of California will yield particles having energies of only 50,000,000 electron volts.

At 10,000 trillion electron volts, the cosmic ray energy is something like a billion times greater.

Science News Letter, October 29, 1938

PHYSIOLOGY

Anti-Hemorrhage Chemical Found in Liver Alcohol

A CHEMICAL that counteracts tendency to hemorrhage, in dogs and rats at least, has been found in a solid alcohol obtained from liver.

Whether it will prove useful in treating human patients suffering from hemophilia or other conditions in which bleeding is a dangerous symptom, is not stated in the report of their discovery made by Drs. A. L. Lichtman and William H. Chambers of Cornell Medical College (*Science*, Oct. 14).

The anti-bleeding material, known chemically as a sterol, makes the blood clot faster in animals with a tendency to bleeding. It acts like vitamin K, newly discovered anti-hemorrhage vitamin, but chemical tests show it is not the same as this vitamin.

Science News Letter, October 29, 1938

GENERAL SCIENCE

Increasing Foundation Funds Augur Well For Research

THE DANGER of a drying up of the financial springs that feed the great foundations has worried many educators and scientists during these days of depression, recession and war alarms.

Foundations are an important and typically American phenomenon. In the past decade millions of dollars of foundation giving have been concentrated upon research and the diffusion of knowledge. Just after the war was an era of endowment and current support for special fields of higher education. If conditions shape themselves so that the funds for giving are reduced, many useful projects would suffer.

Reassurance that foundations will have money to dispense in the future comes from a comprehensive study by Dr. Ernest Victor Hollis of the College of the City of New York's School of Education. ("Philanthropic Foundations and Higher Education" published by Columbia University Press.)

The aggregate wealth funded for philanthropic purposes is substantially increasing. Dr. Hollis finds that during 1937 approximately $600,000,000 was set apart in new foundations—the huge fortune of Andrew W. Mellon leading the list, followed by that of Charles Hayden. This may be contrasted with the approximately $680,000,000 of contributions with which Dr. Hollis estimates higher education has been influenced in the past by foundations.

The 1937 list of donors indicates that those who control the stable fortunes in aluminum, coal and other mining enterprises, in the automotive and food-processing industries, and in the public utility, merchandising, and banking fields are beginning to follow the 1902-14 example of the steel and oil magnates.

The older industries that gave rise to the Carnegie, Rockefeller and other such foundations may therefore be joined by funds of more recent origin.

With increasingly large and diversified sources of revenue, Dr. Hollis feels that the foundations may do even more in the second than the first third of the 20th century to promote the purposes of higher education.

Science News Letter, October 29, 1938

OCEANOGRAPHY

Sea Plants and Animals Concentrators of Radium

SEA plants and animals may act as living concentrators of radium, and deposit this rare element on the bottom when they die and their bodies settle down to become part of the ooze.

This is the suggestion of Drs. Robley D. Evans of the Massachusetts Institute of Technology, Arthur F. Kip of the University of California, and E. H. Moberg of the Scripps Institution of Oceanography (*American Journal of Science*).

The three scientists point out the efficiency of marine organisms in extracting and concentrating other minerals that exist in very dilute state in the water. Thus, shelled animals take out calcium, seaweeds extract iodine and potassium. One seaweed species gathers the rather scarce element barium.

The researchers carried out tests on kelp and on the small organisms that make up the plankton or drifting population of the sea. They found that the radium concentrations in them were about 100 times that of the water in which they live.

Deep water in the sea contains more radium than water near the surface, and the bottom mud contains still more, it was found. This finding, the investigators state, "supports the view that the high radium content of deep-sea sediment is mainly due to fine particles which have settled down from overlying water."

The three scientists consider it likely that radium in sea water originated in land rocks and was carried down by rivers.

Science News Letter, October 29, 1938

IN SCIENCE

MEDICINE

Rabbits Better Than Horses For Anti-Pneumonia Serum

ANTI-PNEUMONIA serum made from rabbits' blood rather than horses' should be used for treating Type XIV pneumonia, it appears from studies reported (*Science*, Sept. 16) by Drs. Charles L. Hoagland, Paul B. Beeson and Walther F. Goebel of the Hospital of the Rockefeller Institute for Medical Research.

The sugary capsule covering of the Type XIV pneumonia germ is closely related, chemically and immunologically, to the blood group specific substances, the Rockefeller scientists find. The relationship is so close that it might incite in the horse the formation of substances that can cause clumping or agglutination of human red blood cells. It apparently does not incite the formation of these bloodcell-clumping substances in the rabbit.

These studies of the pneumonia germ may explain occasional untoward reactions, and even death, noted after serum prepared from horse blood had been used in treating Type XIV pneumonia.

Science News Letter, October 29, 1938

PHOTOGRAPHY

U. S. To Take Lead In Photography Standards

AMERICA is taking the lead in the work of standardizing the field of photography, it is announced by the American Standards Association.

At the request of the International Standards Association, a new committee on standardization is to be appointed. It will represent 40 different organizations including: federal government departments, user groups, manufacturers of photographic materials, distributors, and some twelve that might be classified as general interest groups.

Duties of the new committee will be to initiate a project on standardization in the field of photography under the leadership of the Optical Society of America and also to take leadership in the international project on photography as well as cooperating in the work.

Science News Letter, October 29, 1938

E FIELDS

PHYSIOLOGY

Fertility Vitamin Dose Expressed Mathematically

HOW much of the fertility vitamin E ing used to save rare native quail and to enable her to produce offspring?

Answer to this question, obviously of importance in agriculture and possibly of eventual significance in human family life as well, has been sought by A. L. Bacharach, of the Glaxo Laboratories in Greenford, Middlesex. Mr. Bacharach offers (*Nature*, Oct. 8) a mathematical formula for the proper dose, which he has worked out after breeding experiments with between 200 and 250 laboratory animals. More detailed technical publication is promised later.

Science News Letter, October 29, 1938

POPULATION

We Have Migration Problem But Not of a Minority

AMERICA, like Europe, has her problems of transfer of population. But here the trouble is with majorities, not minorities. And the need arises not from national or racial origins, but from lack of employment.

The productivity of the individual farm worker increased 41 per cent in the two decades from 1910 to 1930. The output of the manufacturing worker increased 63 per cent between the turn of the century and 1930.

Naturally, unless new markets can be found to absorb the goods produced by modern efficiency methods, unless hours are shortened, large numbers of men will be looking for jobs.

In agricultural regions, this problem is acute. At least 2,500,000 workers now on farms, and all the increase that this greatest of American child-bearing regions may provide in the future, must find non-agricultural employment. This is the estimate of the "Study of Population Redistribution" conducted for the Social Science Research Council and quoted in a new "Research Memorandum on Population Redistribution Within the United States" just made public.

Where can they go? This question is basic to any national population policy. Normally, in good times, the rural surplus gravitates to the city. But can we hope that the future will hold any expansion of industry sufficient to absorb such numbers in addition to those released from industrial employment through greater worker productivity?

Exploration of reemployment opportunities is the purpose of a National WPA Research Project. Research in this field is needed and needed badly in order to relieve the United States from the horrible paradox of empty stomachs amid overflowing fields, of idle men unable to build for homeless children.

The predicament of some 3,500,000 men in an undesirable social situation was sufficient to take all Europe to the brink of war.

The problem of millions of young Americans seeking a means to earn their bread is one worthy of cooperative intellectual effort in our nation.

Science News Letter, October 29, 1938

PLANT PHYSIOLOGY

Plant Cells Survive Freezing in Liquid Air

QUICK freezing in liquid air does not kill plant cells, if they are deprived of part of their water first and then frozen quickly enough. Thawing out must be rapid, too.

These results of low-temperature biological experiments are reported by Drs. Basile J. Luyet and Gregory Thoennes of St. Louis University. (*Science*, Sept. 23)

They worked with the living cells in the outer layer (epidermis) of onion skin, and liquid air at the temperature of about 190 degrees below zero Centigrade. When the cells were immersed in completely fresh condition they were all killed. But when part of the water was drawn out of them by preliminary chemical treatment part of the cells survived the frigid bath.

Drs. Luyet and Thoennes found that the chief mischief to living cells is not done at the extreme low temperature, but in the first 15 degrees Centigrade below the freezing point. If crystals are going to form in the cell sap, they will form at this relatively high temperature, and it is ice crystals that do the mischief. The glassy, non-crystalline state of frozen water at extremely low temperatures seems to be less harmful to life.

The nearer to pure water is the cell sap, the more likely the fatal crystals are to form. "Thickening" the sap by the chemical withdrawal of water enabled it to pass the dangerous crystallizing stage more easily.

Science News Letter, October 29, 1938

INVENTION

New Type Aerial Bomb Among Latest Patents

A NEW type aerial bomb, with a tiny, spinning propeller in its nose, was among the 703 inventions awarded patents by the U. S. Patent Office.

The new bomb patent of Harold M. Brayton of Westfield, N. J. (No. 2,131,037) provides an easy and low cost method of putting the missile into firing position shortly after it is dropped from a plane. Present fuses, states the patent, are ingenious, complicated devices costly to make and requiring a great many machine operations.

The new propeller fuse automatically goes into operation when the bomb is dropped. The spin of the tiny propeller gradually turns a screw which brings the firing pin back into the proper position for firing at impact.

For practice in the firing of chemical trench mortars is the patent (No. 2,131,048) of Master Sergeant Merriel Dale Keyser of Edgewood Arsenal, Md., which fires tiny dummy shells at miniature terrain. Rubber bands supply the propellent force.

Real chemical mortars are fired, states the patent, by placing rings of powder in the gun, up to eight in number. The latter gives maximum range. Lesser distances each require their own specific charge. Training is needed in estimating the amount of charge for a given distance and it is to give practice in this art, without actually firing real mortars, that the invention relates.

Instead of a choice of charges of powder there is a choice of rubber bands up to eight in number. The small device may be attached to a real mortar and a gun crew trained in a sequence of parallel actions, at the gun, without actually firing a shell.

Science News Letter, October 29, 1938

PHYSICS

Radio-Heated Rivet in World's Fair Building

HERALDING, perhaps, a day when radio waves will be used for purposes other than just communication, the last rivet to be driven into the frame for the Radio Corporation of America's World Fair exhibit building in New York was brought to white heat by means of radio waves.

Held in a concentrated field of radio waves, the rivet was brought to white heat in a little more than a minute.

Science News Letter, October 29, 1938

ASTRONOMY

Two Darknesses

Total Eclipse of Moon, Partial of Sun, This Month; Astronomers to Mark Bi-Centenary of Herschel's Birth

By JAMES STOKLEY

See Front Cover

NOVEMBER brings two eclipses. One, a total eclipse of the moon, on the seventh, will be visible in all parts of the United States except the far west. The second, a partial of the sun on the 21st, will not be visible in the United States except in the far west, which seems to be a very equitable arrangement. However, the lunar eclipse will be considerably more interesting.

An eclipse is caused when a dark object comes in front of something else and conceals it from view, or when a dark body comes between a bright one and another dark one on which its light is shining. The moon eclipse is of the latter sort. The moon, like the planets, has no light of its own but shines by reflected sunlight.

Every time the moon is full, it is in practically the opposite direction from the sun, so we see its entire sunlit half. Usually, however, the earth is sufficiently far above or below the exact line joining the other two bodies so that our shadow does not fall on the moon. But occasionally, as this month, the three come in the same line. The solid earth prevents sunlight from reaching the moon, which is then eclipsed.

The moon passes through the terrestrial shadow from right to left. At 3:41 p. m. Eastern Standard Time, the eastern edge of the moon makes its first contact with the shadow. About an hour later, at 4:45 p. m., it is completely engulfed and the eclipse is total. At 6:08 p. m. the edge of the moon begins to emerge, and at 7:12 p. m. the total eclipse is over.

"Blood on the Moon"

Even in the eastern part of the country the eclipse will not be visible in its entirety. At Philadelphia, for example, the moon does not rise until 4:46 p. m. When it does, the eclipse will have started. The moon then will have a curious coppery red color, for the earth's shadow is not entirely dark. It would be were it not for the earth's atmosphere, which acts as a lens, and bends some sunlight around into the shadow. This light has a ruddy hue, for some of the blue rays are removed by passage through the atmosphere. These give the daytime sky its usual color.

For observers in the eastern part of the country, this eclipse has a very strange feature, which occurs some place at every such eclipse, though it has not happened to occur in the United States for many years. They will be able to see the sun and the totally eclipsed moon at the same time. At first glance, this might seem physically impossible, for does not the total eclipse occur when the earth, moon and sun are in the same straight line? If so, how could the sun and moon then both be above the horizon at once?

Refraction

The answer to this seeming paradox is found in the same cause that makes the light shine into the earth's shadow: refraction. This bends the light from any celestial body so that it always appears slightly higher in the sky than it really is. The lower it is, the greater is the effect. At the horizon, the elevation is a little more than the diameter of the sun or moon.

When we see either one just above the horizon, they are actually below it, and would vanish if the atmosphere were suddenly to be removed. Thus, wherever the moon rises totally eclipsed or between 4:45 p. m. and 6:08 p. m., Eastern Standard Time, it will appear a few minutes before sunset.

If you were able to view this happening from a crater on the moon, it would look like the illustration on the front cover of this week's SCIENCE NEWS LETTER. James Perry Wilson, staff artist for American Museum Natural History, made the painting.

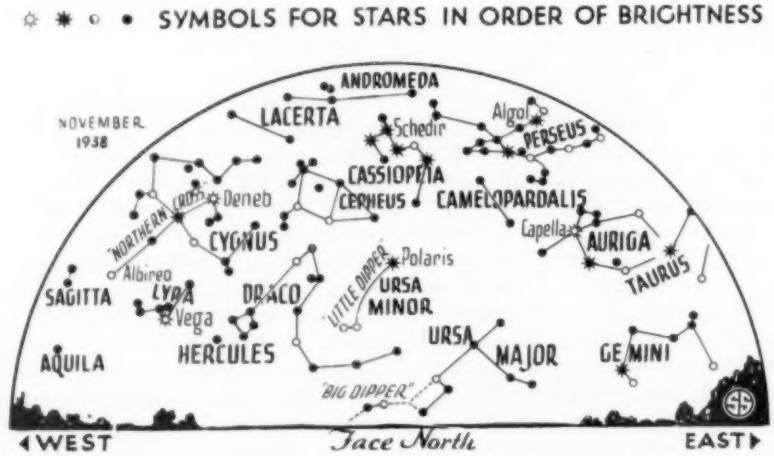
The month's second eclipse, of the sun, is merely partial, because the dark inner part of the moon's shadow will not reach the earth at all, though the outer part will. Where it is at a maximum, in the middle of the Pacific Ocean, a little more than three-quarters of the sun's diameter will be covered by the dark lunar disc.

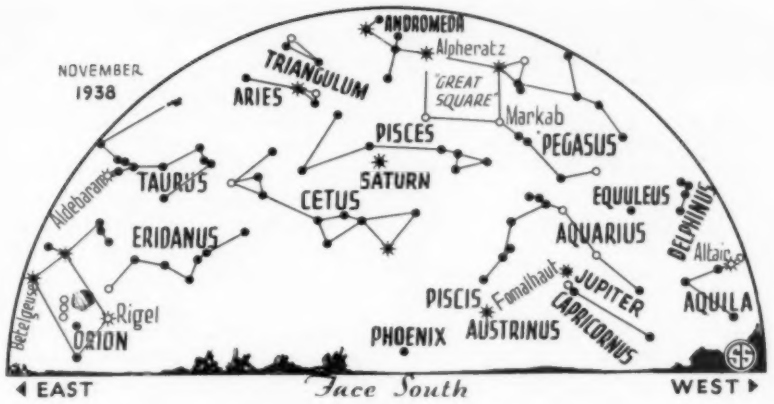
Crosses Date Line

The same eclipse will be seen over most of the northern Pacific Ocean, the western coast of the United States and Canada, Alaska, eastern Siberia and China, and Japan. On the Asiatic side of the International Date Line, which divides the area almost in half, it will be November 22, but on the North American side it will still be the 21st.

As a partial eclipse is of no scientific importance, no efforts are being made to observe it. Even in British Columbia, Washington, Oregon and California, it will not be at all spectacular, for the sun will set before the eclipse has reached its height. However, the people in these states may notice, as the sun descends into the ocean, that a piece is apparently bitten out of the lower edge, the effect of the encroaching edge of the moon.

To the astronomer, especially those interested in the history of their science, November 15 will be an important date. It marks the two hundredth anniversary





of the birth, in Hanover, Germany, of Friedrich Wilhelm Herschel, better known to fame as Sir William Herschel. He served with the Hanovarian guards as a bandsman, but after being released (and not deserting, as sometimes stated) from his military obligations, he emigrated to England. In 1766 he became organist at the Octagon Chapel, in Bath. As he was interested in astronomy, and could not afford to buy proper telescopes, he made his own, the first in 1774, which was followed by many others.

With one of these, a reflector, in which the light was focussed by a concave mirror 6½ inches in diameter, he made his first great discovery in 1781, when he found the planet Uranus. Because of this, King George III appointed him King's Astronomer, and installed him in a house at Slough, near Windsor Castle. He was given a pension, so that he could devote his entire attention to astronomy and telescope construction. His greatest was an instrument with a four-foot mirror; one that, even today, would be considered large.

Other important discoveries followed, including two moons of Uranus and two of Saturn. He found out the true nature of the double stars, pairs of bodies revolving around their common centers. He discovered the true form of the Milky Way system, or galaxy, of which the sun is part. It was his suggestion that the great nebula in the constellation of Andromeda was another such galaxy, or, as he called it, an "island universe." Only as recently as 1925 was this confirmed at the Mt. Wilson Observatory.

Aided by Sister

In many of his observations he was aided by his sister, Caroline Herschel, and, later, by his son, Sir John Herschel, whose fame was almost as great as his father's. Sir William died in 1822, the greatest astronomer of his day, and one of the ten greatest of history.

During November the moon will be visible in the evenings except from about the ninth to the twenty-fourth. Its phases are shown below. It is nearest the earth, at perigee, at 11:00 p. m. on the tenth, with a distance of 227,600 miles. Apogee, the greatest distance, comes at 10:00 p. m. on the 26th. The distance is then 251,900 miles.

Except for the moon, the brightest object seen in the evening sky during November is the planet Jupiter. It stands in the southwest at the time for which the accompanying maps are drawn (10:00 p. m., November 1; 9:00 p. m., November 15 and 8:00 p. m., November 30). Near it is Fomalhaut, a bright star in the constellation of Piscis Austrinus, but much inferior in brilliance to the planet. High in the south, in the fishes, Pisces, is the second planet of the November evening, Saturn. It also is considerably fainter than Jupiter, but it is more brilliant than any other object in the vicinity.

Northern Cross

Several easily identifiable star groups appear in the evening. In the west, standing vertically, is the "northern cross," part of Cygnus, the swan, with Deneb at the top. Near the foot of the cross, to the right, is Vega, of Lyra, the lyre, while in a similar position to the left is Altair, of Aquila, the eagle.

High in the south, above and to the right of Saturn, is the "Great Square of Pegasus," though the star in the upper left corner is Alpheratz, of the neighboring constellation of Andromeda. The rest, however, are part of Pegasus, the winged horse. Low in the east are three stars in a vertical row, the belt of Orion, the warrior. The bright star to the right is Rigel, and the one to the left Betelgeuse, both of the same constellation. Above Orion is Aldebaran, of Taurus, the bull. Next to Taurus, to the left, is Auriga, the charioteer, with first magnitude Capella.

The always familiar "big dipper" this month is in its poorest position, low in the north. High in that direction, above Polaris, the pole star, is the well-known M-shaped figure of Cassiopeia.

A few hours before sunrise the planet Mars rises in the east. On the 25th of the month, Mercury will be in the evening sky just after sunset, but so low that it will be difficult to find. Venus has now gone from the sky, for it is close to the sun, and will, in fact, be in line with it on the 20th.

Phases of the Moon:

		E. S. T.
Full	Nov. 7	5:23 p. m.
Last quarter	Nov. 14	11:20 a. m.
New	Nov. 21	7:05 p. m.
First quarter	Nov. 29	10:59 p. m.

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BIOLOGY

Biological Abstracts To Be Published in Parts

BIOLOGICAL Abstracts, key journal for students of the life sciences, has grown too big for the average individual subscriber and is about to do what many organisms do when they become too bulky—split into several parts. Yet this important publication will still manage at the same time to remain one.

Biological Abstracts, like the abstract journals in the other sciences, consists of extremely condensed summaries of articles in all the scientific journals in its particular field, as well as of all new biological books. Scientists, by running through its pages, can get the gist of all articles published everywhere, and thus keep track of what is going on in their chosen lines of activity.

Difficulties have developed, due to the fact that Biological Abstracts summarizes everything that appears in the whole wide field of biology, thus becoming very thick and of course costly to publish. At the same time, practically every biologist is a specialist, reading only the section of the journal devoted to his particular field.

For this reason, the board of editors has announced that Biological Abstracts will henceforward be published in five sections. The individual biologist may subscribe to any section or sections he desires, at annual rates from $6 to $9. The entire journal, with all five sections between the same covers, will continue to be used by libraries, at $25 a year. This arrangement, it is hoped, will do much to solve the financial difficulties previously encountered.

Science News Letter, October 29, 1938

MEDICINE

Sulfanilamide To Be Used In Offensive On Blindness

Trachoma, Affecting Some 30,000 Indians, Will Be Treated With New Chemical Which Seems to Cure It

SULFANILAMIDE, new chemical remedy that has already saved thousands of lives threatened by pneumonia, meningitis, childbed fever and streptococcus infections, is to be used next in a major offensive against blindness, especially among children. This developed at a conference of eye specialists with medical officers of the U. S. Bureau of Indian Affairs.

The particular form of blindness to be attacked by sulfanilamide is that which results from trachoma, the very "catching" eye disease that afflicts between 2,000 and 3,000 new victims each year in the United States. About 17 out of every 100 persons who get trachoma go blind. Quarantine regulations forbid the entry into the United States of any person suffering with trachoma, but cured cases are allowed to enter.

Out of 140 trachoma patients treated with sulfanilamide, 114 were apparently cured, Dr. Fred Loe of the Indian Bureau, stationed at Rosebud, S. D., reported. Other eye specialists have reported similar encouraging results, especially in acute stages of the disease.

Dr. Loe says it is too early to call these cases "sure cures," because there may yet be relapses, but symptoms of the disease have disappeared in the patients treated and those not already permanently blinded can see again. One 47-year-old man reported he saw more than ever before during his entire life.

Encouraging results with sulfanilamide treatment in this serious eye disease have led to plans for its large-scale use among Indians, of whom some 30,000 suffer from the disease.

As soon as arrangements can be made, probably by Nov. 1, sulfanilamide treatment will be started among all child victims of the disease at the Tung River, Mont., Indian Reservation. At one school of 130 pupils there, 84 cases of trachoma have been reported. Children with trachoma at other Indian schools will be given the treatment as soon thereafter as arrangements can be made. The schools at Chenawa, near Salem, Ore., and at Fort Defiance, Ariz., are slated for inclusion in the drive on trachoma with this new weapon.

Adults are not being neglected, but the drive is being started among children because they can be reached through the schools and given continuous treatment there, and also because there is some tendency for the condition to "burn itself out" in older patients.

Trachoma, recognized by Egyptian doctors centuries before the Christian era, is more widespread among Indians than whites in the United States. Navajo Indians are particularly afflicted with it.

The condition starts with little soft lumps on the eyelids. Inflammation, discharge and a thick fleshy film growing over the eye follow. This film blocks vision, and the scars it leaves when it subsides may cause permanent blindness.

Science News Letter, October 29, 1938

ETHNOLOGY

Primitive Man Took His Pink Elephants Seriously

WHEN primitive man got drunk he took his "pink elephants" seriously.

Drinking for fun is a civilized custom, Matthew W. Stirling, chief of the Bureau of American Ethnology, declared, addressing the scientific Cosmos Club. Primitive people had no connoisseur spirit. They drank mainly for religion to get visions and experiences which they considered supernatural.

"I think drinking must have begun first for the supernatural effects it produced," was Mr. Stirling's verdict.

Tracing the family tree of the cocktail and highball, Mr. Stirling finds that somewhere in the Stone Age men began supplementing nature's two basic drinks —milk and water—with more potent concoctions.

"It is amazing," he commented, "the lengths to which the human race will go to avoid drinking water."

Beer has been found in late Stone Age man's jugs, but distilling came later. The oldest record Mr. Stirling can find of it is Aristotle's reference to "burning water." All over the world, he said, these drinks have names that mean fire water, not because of the fiery sensation in the throat but because they can be set aflame with a light.

Speakeasies where people secretly drank tea, coffee, and chocolate were a social problem in Europe within recent centuries, said Mr. Stirling, pointing out that these three drinks were introduced into Europe during the exploration era around 1500 A. D., and that they were all first used as drugs and then as drinks of supposedly wicked habit-forming powers. Chocolate, considered the most vicious, was the subject of stringent prohibition laws.

Beer gardens and bars flourished 2,000 years ago, Mr. Stirling said, describing a bar with all the familiar features except the foot rail, recently unearthed at ruins of Ostia, seaport of Rome. The bar in Ostia has a marble top, shelves for the stock, a storage cellar for wines, two stone seats for casual customers and a garden at the back where people evidently tarried to drink, since there were bronze hooks on a marble slab for hanging wraps.

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ARCHAEOLOGY

Ancient Rome's Port Unearthed For Fair

BECAUSE modern Rome is to hold a World's Fair in 1942, the ruins of ancient Rome's seaport—Ostia at the mouth of the Tiber—are to be completely unearthed.

For the past 30 years, Prof. Guido Calzi has been digging away at Ostia. Ever so often, he has had surprising and intriguing news to relate.

Ostia, it has developed, did some of its shopping in a three-story department store, a grand affair with display windows. Merchants rented quarters inside. It was probably the first big department store Romans knew. An incidental point of interest is a swastika design in one of the ancient floors, said to have pleased the modern Nazi leader when it was shown him.

Some of Ostia's people lived in flats. The city had apartment houses four and five stories high.

Ostia, it seems, was quite a town, despite its second-fiddle role as Rome's market-town seaport. Ostia's population rose to 100,000. And far from being entirely a place of warehouses, wharves, and heavy traffic, the seaport boasted beautiful buildings, a forum, public

ANCIENT BAR

In a Roman city 2,000 years ago drinks were served over this bar. Today it is still suitable for service and its marble floor is still beautiful.

baths, barracks for firemen, and an open air theater. Modern visitors observe with interest the large bar found near the theater.

Ostia's cemetery assumed peculiar lifelikeness because of the carved tombstones on which bakers, merchants, and a variety of other trade folk had themselves portrayed at their daily tasks.

And with all that has been learned by digging, the Italians say that still only one-fifth of the place has been unearthed.

The plan is to bring the whole of Ostia out into daylight, reconstructing what remains of crumbled buildings. The ruins are considered in very good preservation, especially the lower stories.

And with the intensive digging goes a hope that Ostia has more surprises in store. Some of its buildings mentioned in history are yet to be unearthed.

Science News Letter, October 29, 1938

MEDICINE

Local Vaccination Brings Relief From Sinus Disease

Snake Venom Is Recommended For Relieving Pain of Eye Diseases; Adam's Apple is Split Successfully

FOR THE relief of sinus disease sufferers throughout the country, medical science now offers vaccination of the lining of the sick sinus itself.

This treatment, so new it is said to be "dazzling" ear, nose and throat specialists who attended the meeting of the American Academy of Ophthalmology and Otolaryngology, was described by Dr. Frank J. Novak, Jr., of Chicago.

Glandular disturbance is often the cause of so-called winter hayfever or the constant, non-infectious colds that make many persons, especially children, miserable with running noses and sneezing. These sufferers can be rid of their trouble within 24 hours when given doses of thyroid gland extract and calcium lactate, Dr. Novak said, although the treatment must be continued for a long time. This treatment is used for cases which are not due to allergy or supersensitiveness to special foods, dust, pollens or the like.

Conservatism in operating for relief of sinus disease was stressed both by Dr. Novak and by Dr. Frederick T. Hill of Waterville, Me.

"Use one's conscience and do not operate upon sight," was the advice Dr. Hill, himself a surgeon, gave his colleagues.

Thorough study of the patient, and his history, and careful examination of his sinuses, including X-ray pictures, must be made before deciding to operate, Dr. Hill emphasized. Even then, the surgeon should do no more operating than is necessary.

The vaccination for sinus disease which Dr. Novak described is the result of the new trend toward studying the underlying factors in sinus disease.

Older measures of treatment, on the mechanical side, must not be neglected, Dr. Novak said. By this he meant that it is important to see that the openings of the nose and sinuses are large enough to provide adequate ventilation and to allow excess fluid in the sinuses to drain out normally.

The large wandering cells of the body which act as scavengers to destroy invading germs have recently been discovered in large numbers in the mucous membranes that line the sinuses. This discovery led to a search for a way to mobilize these scavenger cells in the infected linings. Local vaccination, the method chosen, is done by instilling into the larger sinus cavities carefully selected and graded doses of foreign protein or of material produced by germs ordinarily causing sinus trouble.

Venoms Relieve Pain

DEADLY rattlesnake and cobra venom can be a great help in relieving pain in diseases of the eye, Prof. M. E. Alvaro of Sao Paulo, Brazil, told members of the American Academy of Ophthalmology and Otolaryngology. Snake venom can also stop dangerous bleeding during eye operations, and it has been recommended for trachoma and for cancer of the eye.

To relieve pain, the venom is either dropped into the eye or injected into the membrane that lines the eyelids and covers the eyeball.

This pain-relieving use of snake venom and the hemorrhage-checking use during operations give the best results of all the many uses to which snake venoms have been put in eye diseases, it appears from Prof. Alvaro's exhaustive report of his own and other investigators' research.

The pain-relieving principle of rattlesnake venom has been isolated from the venom, by other scientists, in the form of pure crystals, and this crystalline material, Dr. Alvaro reported, is twice as active in relieving pain as the pure venom.

"Trachozid," derived by a Viennese doctor through a secret process from the venom of vipers and also of bees, is useful in treating trachoma, an infectious eye disease that often results in blindness. Trachozid, however, cannot yet be considered a specific remedy for trachoma, Dr. Alvaro pointed out.

The use of snake venom for cancer of the eye may be dangerous, he said, because while the venom can destroy cancer tissue, it can also cause spread of cancer from bits of cancerous tissue chewed off the cancer but not destroyed.

The isolation, by different scientists, of the pain-relieving principle of snake venoms and of the blood-coagulating principle, is important, Dr. Alvaro declared, because only by having these and other active materials in pure form can snake venom treatment be made really effective.

Short Circuiting Operation

A SHORT-CIRCUITING operation to relieve chronic watery eyes was reported by Dr. William H. Stokes of Omaha, Nebr.

When infection or inflammation permanently blocks the tube through which the tears naturally leave the eye after bathing it, Dr. Stokes cuts a new opening from the tear sac into the nose.

The operation is not new, but Dr. Stokes has improved it by placing the short-circuit higher than has been customary before. In this way he uses more of the normal lower end of the tear sac and upper end of the duct. The result is closer to nature's own tear drainage arrangement.

Split "Adam's Apple"

IMPROVEMENTS in the operation for removal of cancer of the larynx, or voice box, were described by Dr. M. C. Myerson of New York.

If the cancer is limited to one vocal cord, it is now possible to operate so that after the wound has healed the patient has a fairly good though somewhat weak voice and is able to breathe naturally without the necessity of an opening in the windpipe lower down in the neck.

In the operation, the "Adam's Apple" is split and the cancer cut out. After the cancerous vocal cord has been removed, neighboring tissues are examined immediately in frozen microscopic sections to make sure no cancer cells have been left behind, and the split larynx is sewed up tightly again.

Get Advice on Hearing Aids

DEAFENED persons should seek the advice of doctors specializing in ear diseases when they choose hearing aids, Drs. Horace Newhart and Henry E. Hartig of Minneapolis said.

They warned against "racketeering instrument salesmen" who "exact high prices for instruments which rapidly wear out, batteries which run down quickly, and provide no means for servicing the instrument in order to keep up its efficiency."

The final test of a hearing aid is intelligible, clear speech. Magnifying all sounds for people who are only deficient in certain parts of the scale creates unbearable noise, the two doctors pointed out. Ear specialists can check on this point and also can advise the kind of hearing aid needed by those deafened persons who require sound conduction through the bone back of the ear drum in order to hear.

One guard against the "racketeering instrument salesmen" is seen in the standards for hearing aids set by the American Medical Association, standards to which all reputable manufacturers now adhere.

Science News Letter, October 29, 1938

MEDICINE

Emergency Bank Can Give Blood at Cost of a Dollar

BLOOD to save a life can be furnished in 45 minutes at a cost of one dollar by the blood bank of Cook County Hospital, Chicago, members of the American College of Surgeons were told at the Hospital Standardization Conference.

Blood for 4,400 transfusions, 7.6 per cent. of them definitely life-saving, has been drawn from the bank since its establishment in March, 1937, Dr. Karl A. Meyer, medical superintendent of the hospital, and Drs. Leonard H. Weissman and J. Lester Wilkey of the hospital staff, reported. In less than one out of every 100 cases was any harm done by transfusions with this blood.

Blood from living donors only is deposited in this bank. Cadaver blood, used in blood banks elsewhere, is not favored by the staff because a suitable and sufficient source of supply would not be available.

All the blood in the Cook County

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blood bank comes from friends and relatives of patients receiving transfusions and from patients who need to have some blood withdrawn.

The blood is, of course, typed to determine its group. It is examined by two tests to rule out syphilis. Chemical tests are made to determine its nitrogen content, since too high a level of this might be dangerous to the recipient. It is then stored in the refrigerator. No blood is used after 10 days of storage, although in many other institutions blood four and five weeks old is used.

Other charitable institutions have been allowed to establish credit with the blood bank and blood is furnished these institutions on short notice.

X-Ray of Larynx

PATIENTS with cancer of the larynx, or voice-box, who escape a critical period six years after X-ray treatment are still living and free of the disease 15 years later, Dr. Henri Coutard, of the Chicago Tumor Institute, said in reporting to the American College of Surgeons on a new way of adjusting X-ray dosage to kill cancer of the larynx which cannot be removed by surgical operation.

The new method consists of giving daily very small X-ray doses for two or three weeks as a preparatory treatment. This is followed by a very high dose the last day of continuous treatment. More patients survive for five years—the time limit for calling cancer cured—when they are given this preparatory treatment. If, however, the daily doses are not large enough during the last three days a recurrence of the cancer is provoked after about six years.

Sterilization for Cancer

ABOUT one-third of the women who suffer a recurrence of breast cancer in a form that cannot be operated can be helped by sterilization, Dr. Grantley Walder Taylor of Boston reported.

Most striking benefit occurs to those patients in whom the cancer has spread to the bones. The malignant growth in these cases is temporarily checked and even reduced in extent. Sterilization, however, does not prevent recurrence of breast cancer.

The idea of sterilizing women to prevent recurrence of breast cancer comes from the discovery made some years ago that one of the female sex hormones plays a part in the mechanism that causes cancer.

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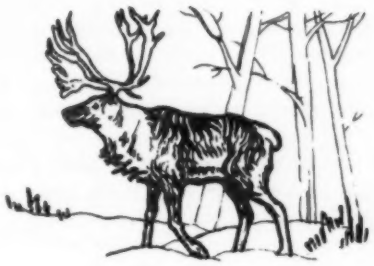
ECOLOGY

NATURE RAMBLINGS
by Frank Thone



Starvation by Fire

FOREST fires like the great conflagration that raged near the head of Lake Superior can kill men and animals long after the last red embers have died out and new green growth has begun to hide the wide black scars. How this delayed death can come to burned-over timber country is told by Hoyes Lloyd, superintendent of wildlife protection in the Canadian National Parks. (*Journal of Forestry,* October)

In past years, great forest fires of unknown origin devastated large areas in northern Ontario. When new growth came in, it was not the same kind of trees that had been burned, but a vegetation type representing an earlier stage in ecological succession. This is usual after forest fires.

The new vegetation, in its turn, supported an entirely different array of animal life; it was the home of deer instead of the caribou that had dominated the animal community of the burned forest. Some have said that the caribou migrated, but Mr. Lloyd believes that the animals that survived the fire simply failed to reproduce, and that the caribou just weren't anywhere any more.

On the caribou a population of Indians, estimated at 10,000, once depended for their principal food supply. These Indians were fairly prosperous, and it was profitable for the whites to operate trading posts among them. After the caribou vanished, however, starvation among the Indians became the rule rather than the exception. Their population dropped to a tenth of the original number and their prosperity vanished. The trading posts had to be closed.

The story is the same in other regions, Mr. Lloyd declares. Where "big woods" are burned, "little woods" take their place, and their game population is quite different. It is usually dominated by deer. But if the fire follows logging-off operations the burning is apt to be repeated several times, and the scanty vegetation that comes in is so little able to support animal life that the region becomes comparatively a biological desert.

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METALLURGY

Machine Gun Barrel Has Life of 1,000 Seconds

SCIENTIFIC studies are now being made of the erosion which occurs in machine gun barrels during firing, and which quickly leads to inaccuracy of fire.

W. H. Snair, metallurgist of the American Can Company and Prof. W. P. Wood of the University of Michigan described how the barrels of machine guns build up a whitish layer of nitrides upon firing.

The average life of a machine gun barrel, they indicated, is only 4,000 to 5,000 rounds. In a short burst of fire of 10 seconds duration, a typical machine gun will fire 50 bullets.

This means that a hundred bursts of fire of this duration would represent the barrel's practical life. During a very heavy attack a defensive machine gun might easily fire this number of bursts and so lose its effectiveness. War veterans, who saw first-hand fighting in France, know that such situations actually arose.

The new studies, identifying the nature of the whitish deposit, may lead to knowledge showing how its formation may be delayed. Supplementary work on the temperatures of its formation tie in with other studies on more effective cooling of machine gun barrels.

Science News Letter, October 29, 1938

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Botany—Biography

THE WORLD WAS MY GARDEN—David Fairchild—*Scribner's,* 494 p., $3.75: David Fairchild roamed the world for years, seeking living treasure of valuable plant life to send back for the enrichment of his home country. Here he sits in the sunset and recites his long Odyssey. A rich life, and like all lives that are truly thus, also an enriching one.

Science News Letter, October 29, 1938

Sociology

PHILANTHROPIC FOUNDATIONS AND HIGHER EDUCATION—Ernest Victor Hollis—*Columbia Univ. Press,* 365 p., $3.50. A critical appraisal of the great American phenomenon of giving for the purpose of higher education and research. The foundation is considered first as a social institution and then in relation to universities and institutions. There are illuminating lists and compilations. See page 280.

Science News Letter, October 29, 1938

Mining

MINERALS YEARBOOK 1938: REVIEW OF 1937—U. S. Dept. Interior—*Govt. Print. Off.,* 1339 p., $2. Every year the Bureau of Mines gives us a comprehensive report on the state of the nation, mineralogically considered. The present volume, like its predecessors, presents detailed and statistical information about every kind of mineral product found beneath American soil, together with comprehensive reviews of the mineral situation in foreign lands.

Science News Letter, October 29, 1938

Geography

THE UNITED STATES AT WORK—656 p., illus., $1.96; TEACHER'S MANUAL FOR THE UNITED STATES AT WORK, 37 p., 16 c.—Maude C. Martin and Clyde E. Cooper—*Heath.* An economic geography text for junior high schools, treating the subject by regions, and showing how geographic factors limit and offer opportunities for development.

Science News Letter, October 29, 1938

Archaeology

EXCAVATIONS AT OLYNTHUS. PART VIII: THE HELLENIC HOUSE—David M. Robinson and J. Walter Graham—*Johns Hopkins Press,* 370 p., 110 plates, $15. At Oynthus, excavations have added a great deal to knowledge of fifth century B. C. Greek homes. This volume is devoted entirely to the types of these homes, their floor plans, architectural features, even to the door steps and types of keyhole, the mural decorations, water supplies, and household equipment.

Science News Letter, October 29, 1938

Natural History

LIFE IN AN AIR CASTLE—Frank M. Chapman—*Appleton-Century,* 250 p., $3. Chapman's "air castle" books have something of the nature of a continued story about them, for old friends crop up in them, with another year or two of life-history and adventures added to their stories. And one meets, of course, fascinating new acquaintances. Only, they have a way of making the reader long for a one-way ticket to Barro Colorado Island, C. Z.

Science News Letter, October 29, 1938

Anthropology

DAHOMEY: AN ANCIENT WEST AFRICAN KINGDOM—Melville J. Herskovits—*Augustin,* 2 vols., illus., $12. From natives of Dahomey, Dr. Herskovits is learning much about the ancestral homeland of many of the American Negroes, and at the same time recording beliefs and customs of a region particularly tenacious of its ancient forms. In these two volumes he describes life in Dahomey with its many remarkable features, and suggests that understanding this culture may help to replace stereotyped views of "savage" African background with a truer picture.

Science News Letter, October 29, 1938

Economics

RESEARCH MEMORANDUM OF POPULATION REDISTRIBUTION WITHIN THE UNITED STATES—Rupert B. Vance—*Social Science Res. Coun.,* 134 p., $1. See page 281.

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Protozoology

BIG FLEAS HAVE LITTLE FLEAS, OR WHO'S WHO AMONG THE PROTOZOA—Robert Hegner—*Williams and Wilkins,* 285 p., illus., $3. A leading student of microzoology takes his fling at popularizing the protozoa. This might seem a rather difficult undertaking, for surely the swarming beasties that do their villanies among our villi, or try to break our very bones with fever-'n'-ague, can hardly be expected to be popular. But Prof. Hegner goes so gaily to his task, aided and abetted by two of his students who have contributed scores of whimsical drawings, that a best-seller career for this book seems an entirely reasonable prospect.

Science News Letter, October 29, 1938

Photography

THE LEICA BOOK IN COLOR—Anton F. Baumann and others—*Westermann,* 56 p., 72 color plates, $4.50. Whether or not you are interested in taking photographs in color with your own camera, you would enjoy the beautiful color pictures in this volume. A brief section of text gives "Fifteen Minutes of Theory" and information regarding new color film and the making of prints from your transparencies.

Science News Letter, October 29, 1938

Botany

FERNS OF THE SOUTHEASTERN STATES—John Kunkel Small; illus. by Ruth Sinclair George—*Science Press,* 517 p., $3.50. It was fortunate that before his lamented death in January of this year Dr. Small had the manuscript for his long-awaited fern book in completed form. It forms a fitting capstone to the monument his labors in systematic botany built, and it will for many years make life easier for botanists and pteridophiles. Descriptions are full, and there are useful and pertinent supplementary remarks; illustrations (all full-page) are simple and clear; keys "work".

Science News Letter, October 29, 1938

Physics

A MANUAL OF EXPERIMENTS to accompany *A First Course in Physics for Colleges* (Rev. ed.)—R. A. Millikan, H. G. Gale and C. W. Edwards—*Ginn,* 221 p., $1.10.

Science News Letter, October 29, 1938

History of Science

HERBALS, THEIR ORIGIN AND EVOLUTIONS: A Chapter in the History of Botany, 1470-1670 (New ed.)—Agnes Arber—*Cambridge* (*Macmillan*), 326 p., $7.50. Fascinating not only for the botanist but for everyone, is the story of botany in its earliest days, when it was still mainly the *famulus* of the physician. This new edition of Agnes Arber's history of herbals will be received with renewed enthusiasm. There has been much new matter discovered since the first edition appeared in 1912, and the book profits not only by these textual additions but also by the inclusion of many more illustrations. To any one interested in either plants or books, this book is a treasure.

Science News Letter, October 29, 1938

Electrical Engineering

STANDARDS OF RADIO RECEIVERS, 1938—*Institute of Radio Engineers,* 58 p., 50 c.

Science News Letter, October 29, 1938